



An **IC Industries** Company

Waukesha Foundry Division
Abex Corporation
1300 Lincoln Avenue
Waukesha, WI 53186
(414) 542-0741

May 7, 1984

U. S. Nuclear Regulatory Commission
799 Roosevelt Road
Glen Ellyn, IL 60137

Attention: Material Licensing Section

Subject: License Amendment to License #48-13776-01

Gentlemen:

Enclosed are the results of the written and practical examinations by Daniel Soch, Ronald Wardinski and Dennis Grace. We are hereby requesting that Daniel Soch and Ronald Wardinski be changed from Assistant Radiographers to Radiographers, and Dennis Grace be added to the license as an Assistant Radiographer.

A check for \$40.00 to cover the amendment fee is enclosed. Thank you for your help in this matter.

Sincerely,

Anthony J. Baures

Anthony J. Baures
Radiation Safety Officer

Enclosures:

RECEIVED BY LFMB	
Date	6/26/84
Log	June 20 1984
By	P. J. W.
Orig. To	LFMB
Action Compl	LFMB

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JUN 14 1984
REGION III

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NMS LIC30
48-13776-01 PDR

Control No. 76951

USNRC Requirements
Written Examination
for
RADIOGRAPHER

1. The absorption of gamma rays from a given source when passing through matter depends on:
 - ☒ A. the atomic number, density, and thickness of the matter
 - B. the Youngs modulus value of the matter
 - C. the Poisson's ratio value of the matter
 - D. the specific activity value of the source
2. The gamma ray intensity at one foot from a one curie source of radioactive cobalt-60 is:
 - ☒ A. 14.4 roentgens per hour
 - B. 1000 roentgens per hour
 - C. 20 roentgens per minute
 - D. 10.3 milliroentgens per second
3. The cobalt-60 used in non-destructive testing emit:
 - A. alpha particles
 - B. neutrons
 - ☒ C. gamma rays
 - D. X-rays
4. The specific activity of an isotope depends on:
 - ☒ A. the time the material has been in the reactor
 - B. the atomic number of the material
 - C. the gamma ray flux to which it was exposed
 - D. the Youngs modulus value of the material
5. What is the maximum level of radiation allowed at the storage head of the Picker cyclops unit when in the shielded position?
 - ☒ A. 2 R/hour
 - ☒ B. 200 mR/hour
 - C. 35 mR/day
 - ☒ D. 50 mR/hour
6. The energy of gamma rays is expressed by which of the following units of measure:
 - A. Curie
 - B. Roentgen
 - C. Half-life
 - ☒ D. Kiloelectron volt (KeV) or million electron volt (MeV)
7. If one curie of iridium-192 produces a dose rate of 5900 mR per hour at one foot, how many mR will ten curies produce at the same distance?
 - A. 590
 - B. 590,000
 - C. 59
 - ☒ D. 59,000

8. Cobalt-59 becomes cobalt-60 when it is placed in a nuclear reactor where it captures:
- A. an electron
 - ☒ B. a neutron
 - C. a proton
 - D. contamination
9. Approximately how long would it take for a 10 curie cobalt-60 source to decay to 2-1/2 curies?
- A. 5.3 days
 - B. 5.3 years
 - ☒ C. 10.6 years
 - D. None of the above
10. Cobalt-60 emits gamma rays of:
- ☒ A. 1.17 and 1.33 MeV
 - B. 0.66 MeV
 - C. 1.09 and 1.29 MeV
 - D. 1.36 and 2.75 MeV
11. For a particular radioisotope, source strength is proportional to which of the following?
- A. Mass of source
 - B. Physical size
 - C. Atomic weight
 - ☒ D. Number of curies
12. Which of the following is true for a smaller isotope source of higher specific activity?
- A. Suffers less from self-absorption of its own gamma radiation
 - B. Less geometric unsharpness in the radiograph
 - C. Allows shorter source-to-film distances
 - ☒ D. All of the above
13. Distance is an effective means of external radiation protection because:
- A. air absorption reduces the radiation intensity
 - ☒ B. radiation intensity varies inversely as the square of the distance
 - C. X-rays and gamma rays have a finite range
 - D. the wavelength of the photons is decreased by their interaction with matter
14. A radiation level of 100 mR/hr is noted at the perimeter of your posted high radiation area. This perimeter is 10 feet from the exposed source. Approximately how far away from the source should the radiation area signs be posted for the 2 mR/hr line.

Control No. 76951

A. 40 feet $2 \text{ mR/hr} = 100 \text{ mR/hr} \left(\frac{10}{r} \right)^2$ $r^2 = 50 \cdot (10)^2$

B. 100 feet

☒ C. 70 feet $\frac{2 \text{ mR/hr}}{2 \text{ mR/hr}} \cdot r^2 = \frac{100 \text{ mR/hr} \cdot (10)^2}{2 \text{ mR/hr}} \cdot r^2$ $r^2 = 50 \times 100$

D. 125 feet $r^2 = \sqrt{5000}$ $r = 70 \text{ ft}$

15. With appropriate controls, the allowable radiation limits in unrestricted areas should not exceed:
- A. 0.500 rem per calendar year
 - B. 2 millirems in any one hour
 - C. 100 millirems in seven consecutive days
 - ☒ D. all of the above
16. A "leaking" source of radioactive material is considered a potentially hazardous situation. At what removable activity level is a sealed radiography source, by regulation, considered to be leaking?
- A. 0.0500 microcuries
 - B. 0.5000 microcuries
 - ☒ C. 0.005 microcuries
 - D. 0.0005 microcuries
17. Sources of radioactive material used for radiography are required by regulation to be leak tested at intervals not to exceed:
- ☒ A. 6 months
 - B. 3 months
 - C. 12 months
 - D. 24 months
18. X-ray photons differ from gamma photons of the same energy only in their:
- ☒ A. biological effect
 - ☒ B. origin
 - C. interaction
 - D. wavelength
19. The half-life of a radioactive substance is equal to:
- A. the reciprocal of the disintegration constant
 - B. the average lifetime of an atom in the substance
 - ☒ C. the time required for one-half of the original atoms to disintegrate
 - D. the number of atoms present divided by the rate of decay
20. Survey instruments used to monitor gamma radiation must be capable of measuring radiation in the range of:
- A. 0-2000 mR/hr.
 - B. 2 mR/hr-10,000 mR/hr.
 - C. 0-200 mR/hr.
 - ☒ D. 2 mR/hr-1000 mR/hr.
21. A radiation area refers to any area accessible to personnel in which radiation exists such that an individual could receive in any one hour a dose exceeding:
- A. 2 millirems
 - B. 100 millirems
 - ☒ C. 5 millirems
 - D. 500 millirems

22. Your radiation survey meter reads 10 mR/hour. How much of a dose will be delivered in one minute? 0.166 mR
 - in one hour? 10 mR/h
 - in 40 hours? 400 mR/h
23. You are working with a 75 curie cobalt-60 source. What is the dose rate at 50 feet? $14 \times 75 \text{ Ci} = 1050 \text{ R/h}$ $D = 1050 \left(\frac{1 \text{ ft}}{50 \text{ ft}} \right)^2$ $D = .42 \text{ R/h}$
 $D = 1050 \left(\frac{1}{2500} \right)$
24. Using a cobalt-60 source you measure a dose rate at 5 mR/hour at 50 feet from the source. You want to set up a boundary where the dose rate will be 2 mR/hour. What should the distance from the source to the boundary be?
 $2 \text{ mR/h} = 5 \text{ mR/h} \left(\frac{50 \text{ ft}}{r} \right)^2$ $\frac{2 \text{ mR/h}}{5 \text{ mR/h}} \cdot r^2 = \frac{5 \text{ mR/h}}{2 \text{ mR/h}} \cdot (50)^2$ $r^2 = 2.5 (50)^2$ $r = \sqrt{6250}$ $r = 79 \text{ ft}$
25. If you have a reliable pocket dosimeter you do not also have to have a film badge?
- ☒ A. True
☐ B. False
26. You can request that the NRC conduct an inspection of your company if you think there are safety problems?
- ☒ A. True
☐ B. False
27. Violations of NRC regulations can result in monetary fines and loss of your company's license?
- ☒ A. True
☐ B. False
28. What is the calibration schedule for the survey meters being used with the cobalt-60 source?
- A. monthly
☒ B. semi-annually
☐ C. quarterly
☐ D. yearly
29. Must dosimeters be calibrated per NRC regulation?
- ☒ A. True
☐ B. False
30. The last day of the shipping month finds both survey meters inoperable and only a single exposure is needed to complete a casting that is absolutely needed. What course of action is acceptable to resolve the situation
- A. receive permission from the Vice-President works manager to proceed
☒ B. take the exposure being especially careful
☐ C. shut the facility down
☐ D. consult with the quality assurance manager and proceed

31. Describe how the unit will be tested for a power failure condition.
 1. Expose the source
 2. Switch off power on dial timer
 3. Note the time required for the source to return to the stored position (1-2 s.)
32. Describe the method used to test the door interlocks leading to the cobalt-60 room. 1) Expose the source, 2) with survey meter in hand, using key to cobalt room open the door, gamma alarm should sound, the source should return to the stored position (observe - red light off green light on)
33. Is it the responsibility of the radiographer that all signs and labels are in their proper position?
- ☒ A. True
☐ B. False
34. Which of the following dosimeter ranges is acceptable for industrial radiography using isotopes?
- A. 0 - 200 R
☒ B. 0 - 5 mR
☐ C. 0 - 200 mR
☐ D. 1 - 10 R
35. On what form will the record of the final shut down survey be recorded on?
- A. Source Order Form 445
 B. Quality Inventory Record 447
☒ C. NRC Form #3
☐ D. Source Utilization and Survey Log 448
36. If a survey meter is out of calibration by two days and a "hot" job comes in for a single exposure in the cobalt-60 room, it is acceptable to carefully take the one exposure?
- A. True
☒ B. False
37. Per the requirements of the operating and emergency procedure may isotope radiography continue with people working on the roof over head?
- ☒ A. True
☐ B. False
38. Describe the method used to secure the cobalt-60 area when a roofing contractor is working on the roof over the cobalt-60 cell.
 Company maintenance supervisor shall arrange for complete securing of facility.
 R.S.O shall secure all sources (locked) have keys on his person
 R.S.O will notify the supervisor of maintenance that it is safe to work
39. Who is responsible for the quarterly maintenance inspection?
- A. maintenance crew
 B. radiographer
☒ C. maintenance superintendant
☐ D. radiation safety officer

Maintenance supervisor
 will notify R.S.O.
 When work is complete
 R.S.O will inform
 maintenance supervisor
 that no one can re-enter
 the area.
 In order to re-enter
 area, entire procedure must
 be started from the beginning.

40. You have been working as a radiographer for several years and due to production requirements an assistant radiographer is assigned to you. Which of the following statements is true?

- A. the person may work in the cobalt-60 area as long as they have a calibrated survey meter
- B. assistant radiographers may not work in the cobalt-60 area
- ☒ C. assistant radiographers can only work in the cobalt-60 area under the personal supervision of a radiographer
- D. if the person has worked in X-ray they may work in the cobalt-60 area

41. Which of the following situations contributes most to overexposure accidents during isotope radiography?

- A. no dosimeter was used
- ☒ B. improper or no survey taken
- C. hot weather
- D. sudden disintegration of the source

42. Describe the method used to survey the Picker Cyclops unit.

The survey meter is placed immediately under the head the reading is noted the meter is placed on both sides of the head the survey meter reading should drop indications that the source is in the stored position

43. How often must the leak test be conducted?

- A. monthly
- B. periodically
- ☒ C. semi-annually
- D. when the source is changed

44. When a cobalt-60 exposure has been set up and the exposure started, what information should be entered in the source utilization log form 448?

Start of exposure	date	location	Present Activity/Level	Exposure time	Radiation level	Radiographer	Notes
1	6/6-84	WBC Lab room		From To	outside closed door		

45. Does the radiographer have the authority to shut down the cobalt-60 area if he suspects a safety problem?

- ☒ A. True
- B. False

46. If during the course of making a set up the gamma alarm red light comes on, what should you do?

- A. complete the set up
- B. go over and hit the gamma alarm on the side, something must be stuck
- C. disregard it
- ☒ D. leave cell immediately and evaluate the situation from outside the cell

47. Per the operating and emergency procedure manual, how many dosimeters are to be worn? two

48. The Picker Cyclops will never be operated at a distance closer than 4 feet from any wall.
49. What information must be on the survey meter before using it?
- a) Date of Calibration
 - b) Signature of Calibrating Person
 - c) The date of the next required Calibration
50. If a survey meter is dropped what should be done with it?

Returned to Control room tag inoperable and exchanged for another and shall not be used until recalibrated

Ron performed the daily inspection procedure and exposure procedure. He checked calibration of survey meter. I asked, if he dropped the survey meter what would he do? He replied he would get another meter from the office and if one was not available he would discontinue operations. Ron passed the practical exam.

A. Baures

Tech/Ops, Inc.

Tech/Ops

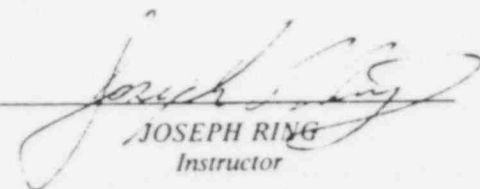
hereby certifies

Ronald N. Wardinski

has successfully completed the course:

"Radiation Safety Aspects of Isotope Radiography"

ATTESTED: 17 September 1982


JOSEPH RING
Instructor


JOHN J. MUNRO, III
Technical Director


ERIC T. CLARKE, Ph.D.
Founder & Director

Dennis Grace
5/3/84

WRITTEN EXAMINATION
for
MANUAL OF OPERATING and EMERGENCY
PROCEDURES FOR INDUSTRIAL RADIOGRAPHY

1. If a survey meter is accidentally dropped, what should be done with it?
2. Under what condition may a radiographer or assistant radiographer work without a dosimeter?
3. The exposure device will never be operated at a distance closer than _____ from any wall.
4. Before maintenance personnel are admitted to radiation areas, what procedure is to be followed?
5. What items are to be checked at the beginning of each days work and recorded on the appropriate form?
6. How many MR will a dosimeter record?
7. If the exposure device should malfunction, may the radiographer repair the device?
8. What frequency is leak testing done?
9. What information must appear on a survey meter before using it?
10. What level of radiation is acceptable 6 inches from any exterior surface of the exposure device?
11. What label shall appear on each device containing sealed byproduct material?
12. What sealed sources is Waukesha Foundry Co. licensed to use?
13. What is to be done when a survey meter becomes inoperable?
14. How many dosimeters must a radiographer wear during radiographic operations?
15. When the "Daily Inspection and Maintenance" procedure is being conducted, how is power failure simulated?
16. What are the duties and responsibilities of the radiographer?
17. Who does the radiographer directly report to?
18. What procedure must be followed at the end of radiographic operations each day?
19. Must a radiation survey be taken before every radiographic exposure?
20. Where is the radiographic restricted area located?

21. The keys to the Picker Cyclops are under whose direct control?
22. How often will dosimeters be checked by the radiographer during radiographic operations?
23. Does the replacement of batteries in a survey meter require recalibration?
24. How many rem per year are allowed for a whole body dose?
25. How often are the films for the film badge monitoring system to be changed?

Minimum passing grade 80%

Answers on separate paper.

Dennis Grace explained how he would replace a battery if the meter should need it. He went through the daily maintenance procedure. Also he went through a radiographic exposure and followed all the points for survey and documentation. Passed Practical

A. Baures
R.S.O.

5/3/84

Written Exam - Operating & Emergency procedures

1. If a survey meter is dropped you should stop working, take it to the control room and mark on it that it was dropped. It must be sent for recalibration.
2. The radiographer & his assistant may never work without dosimeters.
3. The exposure device will never be operated at a distance closer than 4 feet from any wall.
4. Before maintenance personnel are admitted: Supervisor of Maintenance dpt. must arrange for complete securing of the facilities for required time. R.S.O. must check that all sources are safe and locked. He must keep interlock and source lock keys. Give an OK to maintenance, maintenance must check back with him when complete. They may not re-enter again without following the procedure again.
5. Radiation Level, Shutter time, Door Interlock, Warning Lights, Emergency Shutter, Power Failure, Signs & Labels must be checked at the beginning of each day's work.
6. A dosimeter can record up to 200 mr.
7. The radiographer may not repair the device.
8. Leak tests must be performed every 6 months.
9. Label on survey meter → date of calibration, Signature of calibrating person, date of next required calibration.
10. Exposure devices may not have a radiation level in excess of 50 mr per hour at 6" from the exterior.
11. Each device must have a label with the radiation caution symbol, The words "caution radioactive material" and the type and quantity of material.

5/3/84

12. Waukesha Foundry Co. is licensed for Co⁶⁰
13. If a survey meter becomes inoperable, work is to cease until meter has been serviced & recalibrated or replaced by another.
14. A radiographer must wear 2 dosimeters.
15. With the unit on, shut off the main power supply, the unit should return to the off position.
16. Duties of Radiographer: Compliance with N.R.C. Regulations and procedure in the manual, for him or people under his supervision. Enforcement of all personnel safety rules, Availability, use, and good working condition of all personnel monitoring equipment. Recording dosimeter readings, reporting of radiological health emergencies to R.S.O. Recording results of daily inspection & maintenance procedure on Form 451
17. Radiographer reports directly to the Radiation Safety Officer
18. At the end of each day the head of the unit will be surveyed and readings noted on Source Utilization Form 448. The door to the exposure room will be locked.
19. Yes, a survey must be taken before every exposure.
20. Restricted area is where a person could receive an exposure in excess of 2mr in any one hour. In our area it is at the door entrance to the room.
21. The keys to the Picker Cyclops are under the R.S.O.'s control.
22. Dosimeters should be checked every few hours during operation.
23. No replacing batteries in a survey meter does not require recalibration
24. 5 rem per year for a whole body dose.
25. Film is changed every month in film badges

Control No. 76951

Tech/Ops, Inc.

Tech/Ops

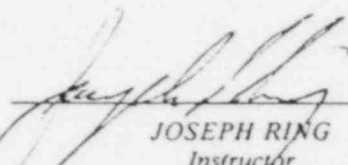
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DENNIS GRACE

has successfully completed the course:

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ATTESTED: April 13, 1984


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86 / Dan Soch
6/6/84

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 - C. 35 mR/day
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 - C. 59
 - ☒ D. 59,000

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 - ☐ C. X-rays and gamma rays have a finite range
 - ☐ D. the wavelength of the photons is decreased by their interaction with matter
14. A radiation level of 100 mR/hr is noted at the perimeter of your posted high radiation area. This perimeter is 10 feet from the exposed source. Approximately how far away from the source should the radiation area signs be posted for the 2 mR/hr line.
- $$D = D_0 \left(\frac{r_0}{r} \right)^2$$

$$\frac{2 \text{ mR/hr}}{100 \text{ mR/hr}} = \left(\frac{10 \text{ ft}}{r} \right)^2$$

$$\frac{2}{100} = \frac{100}{r^2}$$

$$r^2 = \frac{100 \times 50}{2}$$

$$r^2 = 2500$$

$$r = 50 \text{ ft}$$
- ☐ A. 40 feet
 - ☐ B. 100 feet
 - ☒ C. 70 feet
 - ☐ D. 125 feet

15. With appropriate controls, the allowable radiation limits in unrestricted areas should not exceed:
- A. 0.500 rem per calendar year
 - ☒ B. 2 millirems in any one hour
 - C. 100 millirems in seven consecutive days
 - D. all of the above
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 - B. 0.5000 microcuries
 - ☒ C. 0.005 microcuries
 - D. 0.0005 microcuries
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 - B. 3 months
 - C. 12 months
 - D. 24 months
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- A. biological effect
 - ☒ B. origin
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19. The half-life of a radioactive substance is equal to:
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 - ☒ C. the time required for one-half of the original atoms to disintegrate
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 - C. 0-20C mR/hr.
 - ☒ D. 2 mR/hr-1000 mR/hr.
21. A radiation area refers to any area accessible to personnel in which radiation exists such that an individual could receive in any one hour a dose exceeding:
- A. 2 millirems
 - B. 100 millirems
 - ☒ C. 5 millirems
 - D. 500 millirems

$$= 1080 \left(\frac{1}{2500} \right) R/hr$$

- 4 -

$$= .432 R/hr$$

22. Your radiation survey meter reads 10 mR/hour. How much of a dose will be delivered in one minute? $.1666 mR$ Dose = $10 mR/hr \times \frac{1}{60} hr$
 - in one hour? $10 mR$
 - in 40 hours? $400 mR$ $= 10 mR/hr \times .0166 hr$
23. You are working with a 75 curie cobalt-60 source. What is the dose rate at 50 feet? $.432 R/hr$ $D = D_0 \left(\frac{r_0}{r} \right)^2$ $D = 75 Ci \times \frac{14.4 R/hr}{1 Ci} \times \left(\frac{1 ft}{50 ft} \right)^2$
24. Using a cobalt-60 source you measure a dose rate at 5 mR/hour at 50 feet from the source. You want to set up a boundary where the dose rate will be 2 mR/hour. What should the distance from the source to the boundary be?
 $82 ft.$ $D = D_0 \left(\frac{r_0}{r} \right)^2$ $2 mR/hr = 5 mR/hr \left(\frac{50 ft}{r} \right)^2$
25. If you have a reliable pocket dosimeter you do not also have to have a film badge?
 A. True
 B. False
26. You can request that the NRC conduct an inspection of your company if you think there are safety problems?
 A. True
 B. False
27. Violations of NRC regulations can result in monetary fines and loss of your company's license?
 A. True
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 A. True
 B. False ~~yes~~
30. The last day of the shipping month finds both survey meters inoperable and only a single exposure is needed to complete a casting that is absolutely needed. What course of action is acceptable to resolve the situation
 A. receive permission from the Vice-President works manager to proceed
 B. take the exposure being especially careful
 C. shut the facility down
 D. consult with the quality assurance manager and proceed

31. Describe how the unit will be tested for a power failure condition.

Turn unit on. Turn main switch on control panel off. The source should automatically go to the closed position. Green light on panel should be on. Green lights on.

32. Describe the method used to test the door interlocks leading to the cobalt-60 room.

With unit on check to see if red lights are flashing.

Open door to room. Unit should go to closed position. Red lights off, green and white lights on.

33. Is it the responsibility of the radiographer that all signs and labels are in their proper position? *Yes*

- ☒ A. True
- ☐ B. False

34. Which of the following dosimeter ranges is acceptable for industrial radiography using isotopes?

- A. 0 - 200 R
- B. 0 - 5 mR
- ☒ C. 0 - 200 mR
- D. 1 - 10 R

35. On what form will the record of the final shut down survey be recorded on?

- A. Source Order Form 445
- B. Quality Inventory Record 447
- C. NRC Form #3
- ☒ D. Source Utilization and Survey Log 448

36. If a survey meter is out of calibration by two days and a "hot" job comes in for a single exposure in the cobalt-60 room, it is acceptable to carefully take the one exposure? *No*

- A. True
- ☒ B. False

37. Per the requirements of the operating and emergency procedure may isotope radiography continue with people working on the roof over head? *No*

- A. True
- ☒ B. False

38. Describe the method used to secure the cobalt-60 area when a roofing contractor is working on the roof over the cobalt-60 cell.

Supervisor of maintenance arranges securing of facilities for required time. RSO checks source for locking and keeps keys. RSO notifies maintenance supervisor to proceed and contact back to him on completion. Remind that once work is done, no reentry is possible without going through whole procedure again.

39. Who is responsible for the quarterly maintenance inspection?

- A. maintenance crew
- B. radiographer
- C. maintenance superintendant
- ☒ D. radiation safety officer

40. You have been working as a radiographer for several years and due to production requirements an assistant radiographer is assigned to you. Which of the following statements is true?

- ☐ A. the person may work in the cobalt-60 area as long as they have a calibrated survey meter
- ☐ B. assistant radiographers may not work in the cobalt-60 area
- ☒ C. assistant radiographers can only work in the cobalt-60 area under the personal supervision of a radiographer
- ☐ D. if the person has worked in X-ray they may work in the cobalt-60 area

41. Which of the following situations contributes most to overexposure accidents during isotope radiography?

- ☐ A. no dosimeter was used
- ☒ B. improper or no survey taken
- ☐ C. hot weather
- ☐ D. sudden disintegration of the source

42. Describe the method used to survey the Picker Cyclops unit.

Approach unit watching survey meter. Put meter right up to ~~the~~ collimator noting reading it should be consistent to the norm, survey around head.

43. How often must the leak test be conducted?

- ☐ A. monthly
- ☐ B. periodically
- ☒ C. semi-annually
- ☐ D. when the source is changed

44. When a cobalt-60 exposure has been set up and the exposure started, what information should be entered in the source utilization log form 448?

Serial number, date, location, Preset Cal. activity, exposure times, Radiation level outside closed door, radiographer's name or initials, ~~and~~ what view you are shooting.

45. Does the radiographer have the authority to shut down the cobalt-60 area if he suspects a safety problem? *yes*

- ☒ A. True
- ☐ B. False

46. If during the course of making a set up the gamma alarm red light comes on, what should you do?

- ☐ A. complete the set up
- ☐ B. go over and hit the gamma alarm on the side, something must be stuck
- ☐ C. disregard it
- ☒ D. leave cell immediately, and evaluate the situation from outside the cell

47. Per the operating and emergency procedure manual, how many dosimeters are to be worn? *Two*

✓ 48. The Picker Cyclops will never be operated at a distance closer than ~~5 feet~~ 4 ft from any wall.

49. What information must be on the survey meter before using it?

a - ~~date~~ date of calibration

b - signature of calibrating person

c - date of next required calibration

50. If a survey meter is dropped what should be done with it?

Returned ~~to~~ clearly marked to control room and exchanged for another and ~~it~~ shall not be used until recalibrated.

Dan went through the daily inspection procedure and exposure - procedure. He surveyed properly and tested the points of the inspection procedure. Passed the practical exam.

A. Baures

Radiation Safety Officer

Tech/Ops, Inc.

Tech/Ops

hereby certifies

DANIEL SOCH

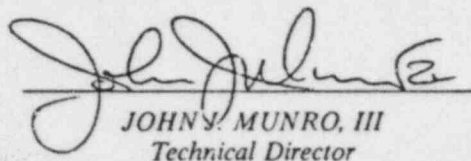
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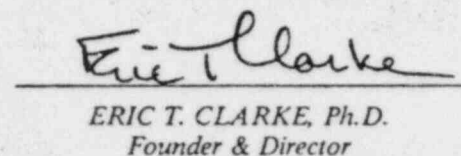
"Radiation Safety Aspects of Isotope Radiography"

March 18, 1983

ATTESTED: _____


JOSEPH RING
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ERIC T. CLARKE, Ph.D.
Founder & Director

Control No. 76951